

TEST #2

Math 236

Spring 08

score ____/100

Name _____

Extra Credit: What 1980's TV sitcom starred Michael J. Fox as Alex P. Keaton?

1. Integrate $\int x e^{3x} dx$

8 points

1) Answer _____

2. Integrate $\int \frac{2x^2 + 6x - 7}{x^2 + 3x - 4} dx$

10 points

2) Answer _____

3. Integrate $\int \frac{x^2}{\sqrt{1-x^2}} dx$

10 points

3) Answer _____

4. Integrate $\int \tan^3(x) \sec^3(x) dx$

8 points

4) Answer _____

5. Integrate $\int \frac{1}{(9+x^2)^{\frac{3}{2}}} dx$

9 points 2

5) Answer _____

6. Integrate $\int e^x \sin(x) dx$

8 points

6) Answer _____

7. Integrate $\int_1^{\infty} \frac{x}{(x^2+1)^2} dx$

9 points

7) Answer _____

8. **TRUE OR FALSE:** $\int_1^5 \frac{1}{x-2} dx = \ln 3$

8) Answer _____ 2 points

9. **MULTIPLE CHOICE:** The partial fraction decomposition for $\frac{x^2-3x+1}{x^2(x^2+1)(x-3)^2}$ is 2 points

A) $\frac{Ax+B}{x^2} + \frac{Cx+D}{x^2+1} + \frac{E}{x-3} + \frac{F}{(x-3)^2}$ B) $\frac{A}{x} + \frac{B}{x^2} + \frac{Cx+D}{x^2+1} + \frac{E}{x-3} + \frac{F}{(x-3)^2}$ C) $\frac{Ax+B}{x^2} + \frac{Cx+D}{x^2+1} + \frac{Ex+F}{(x-3)^2}$

10. **FILL IN THE BLANK:** $\int \sec x dx =$ _____

2 points

11. **Derive** the reduction formula $\int \cot^n(x) dx$.

8 points ³

12. Find the area under the curve $y = \frac{1}{1+e^x}$ for $x \in [0, \ln(5)]$. Simplify your answer as much as possible.

9 points

Area _____

13. Estimate $\int_1^9 x^3 dx$ with $n = 4$ subdivisions using:

15 points

A) **RIGHT HAND RULE**

RHS _____

B) **LEFT HAND RULE**

LHS _____

C) **TRAPEZOID RULE**

Trapezoid _____

D) **MIDPOINT RULE**

Midpoint _____

E) **SIMPSON RULE**

Simpson _____

F) Determine the smallest value for the number of subintervals, n , for which you could **guarantee** the error in your trapezoid approximation would be less than 0.0001.

$n =$ _____